

Develop Hydrophilic Conductive Coating Technology with High Oxidation Resistance for Non-Flow-Through PEM Fuel Cells and Electrolyzers, Phase I

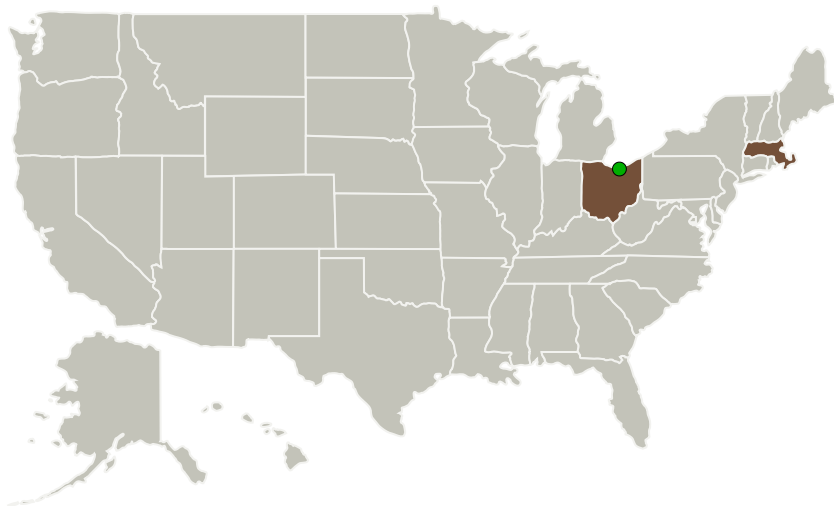
Completed Technology Project (2011 - 2011)



Project Introduction

ElectroChem proposes to develop oxidation resistant, electrically conductive, hydrophilic coatings in PEM fuel cells and in PEM electrolyzers. The use of hydrophilic coatings can improve the transport of the water within the cells resulting in higher electrochemical performance. However, the successful development of oxidation resistant hydrophilic coatings will be the key requirement due to the fuel cell and electrolyzer oxidation environment. Oxidation resistant coatings will be developed on metal substrates using both inorganic and organic coating processes using conductive hydrophilic materials. In these processes, cross-linking of the inorganic and organic materials with the metallic substrate is a key to successfully obtaining coatings with excellent performance and durability. Advanced methods will be developed to control the degree of cross-linking and retaining hydrophilicity in order to obtain the required oxidation resistance for the electrically conductive, hydrophilic coatings. All coatings developed in Ph I will be tested for oxidation resistance, conductivity, and hydrophilic character. In Ph II, the most promising coatings will be evaluated via their performance in PEM non-flow-through fuel cells and in electrolyzers.

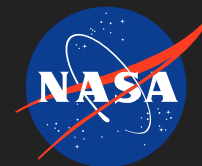
Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
ElectroChem, Inc.	Lead Organization	Industry Minority-Owned Business, Women-Owned Small Business (WOSB)	Woburn, Massachusetts
● Glenn Research Center(GRC)	Supporting Organization	NASA Center	Cleveland, Ohio

Primary U.S. Work Locations

Massachusetts	Ohio
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Project Transitions

▶ **February 2011:** Project Start

✓ **August 2011:** Closed out

Closeout Documentation:

- Final Summary Chart(<https://techport.nasa.gov/file/138086>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

ElectroChem, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

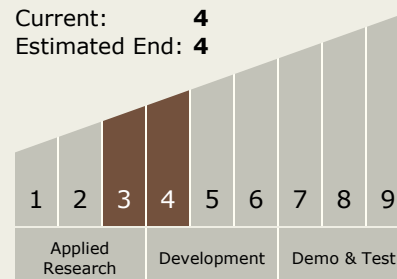
Carlos Torrez

Principal Investigator:

Shyhing Pien

Technology Maturity (TRL)

Start: 3
Current: 4
Estimated End: 4



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Technology Areas

Primary:

- TX03 Aerospace Power and Energy Storage
 - └ TX03.2 Energy Storage
 - └ TX03.2.2 Electrochemical: Fuel Cells

Target Destinations

The Moon, Mars, Outside the Solar System, The Sun, Earth, Others Inside the Solar System